

FRACTURING (FRACING) AND DISPOSAL OF FLUIDS

Introduction

Many unconventional gas reservoirs require a stimulation phase, a physical technique called fracturing (or Fracing) is conducted, to enhance the permeability (open-up the gas reservoir), allowing the natural gas to flow to the wellbore. There are a range of Fracing techniques and several different approaches may be applied within a specific area.

What is Fracturing or Fracing?

Fracing is the process where a fluid (water, nitrogen, polymer, or oil-based) is injected at high enough pressures to fracture or crack the rock in the target zone (most commonly coal, shale or tight rock). A hard substance (the proppant), silica sand, ceramics or resin-coated material, is mixed with the fluid to hold the cracks open once the pressure is lowered. In the Fracing process, the fluid/proppant mixture is injected into the specific horizon that is targeted deep below surface.

These fractures/cracks are held open by the proppant, and they allow the natural gas to migrate to the wellbore.

Fracing requires a lot of heavy equipment at the well site for the duration of about a day. The equipment includes: compressors, fluid tankers, proppant trucks, mixing tanks, an operations trailer and other components.



What is Fracturing Fluid and How is it Disposed?

Fracturing fluids vary in composition based on engineering requirements specific to the reservoir rock type that will produce the natural gas. After the fluid/proppant mixture is forced into the target rock unit, the fluid is pumped/flowed back to surface and collected at the wellsite. Commonly between 50 to 90% of the fluid is recovered.

Most frac fluid is recovered at the well head during testing and production operations. In some cases this fluid may be stored, treated and re-used. When the fluid is to be disposed, it is generally trucked to an approved disposal well or facility. Here it must be pumped into a deep underground formation, using a wellbore that has been reviewed and approved by the OGC.

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The Role of the OGC

Companies must make an application to the Oil and Gas Commission for deep well disposal. The OGC reviews these applications to ensure:

- oil and gas resources are not impacted
- the proposed disposal or injection zone is compatible with the produced water
- the produced water will remain within the underground formation
- the applicant has obtained the necessary rights to the formation.

A thorough application review is used to minimize the potential for fluid migration between the injection zone and other zones. The composition of the disposed fluid may require that a Permit Effluent (see Information Sheet 14) be issued by OGC on behalf of the Ministry of Environment. As a condition of approval the Commission requires a Monthly Injection/Disposal Statement (BC-S18) form be submitted, reporting volume of fluid and average wellhead pressure. The OGC limits the pressure at which fluid can be injected into the formation to ensure the integrity of the injection zone. There are commercial sites, approved by the OGC, that dispose of fracturing fluids.

Protection of Groundwater

OGC regulations ensure that potable groundwater is protected. This is achieved by drilling practices that include surface casing, cementing surface casing, production casing and cementing production casing (see Figure 1). The drilling and production regulations outline in detail how industry must ensure our water resources are protected.

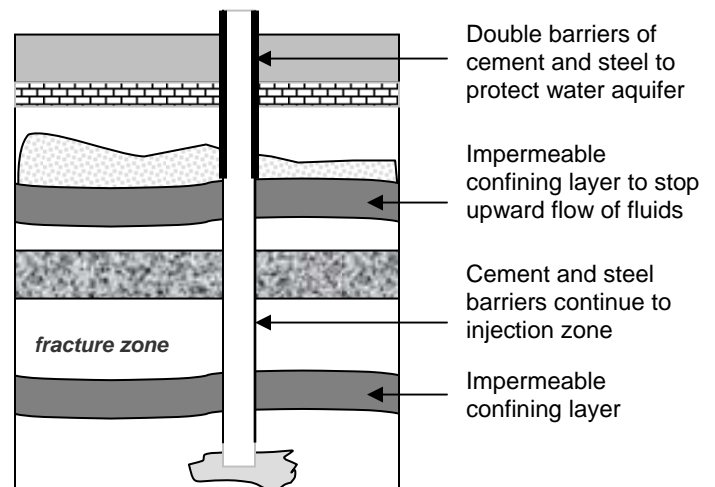


Figure 1 Protecting groundwater with proper drilling practices

Information:

Oil and Gas Commission – Guideline for Application for Approval of Deep Well Disposal of Non-Special Waste https://www.ogc.gov.bc.ca/arb/arb_print.asp_aoid=51.html

Canadian Centre for Energy Information <http://www.centreforenergy.com/Shopping/uploads/50.pdf>